UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/977,193	10/16/2001	Jonas Persson	027557-069	3197

7590 01/12/2005

Ronald L. Grudziecki
BURNS, DOANE, SWECKER & MATHIS, L.L.P.
P.O. Box 1404
Alexandria, VA 22313-1404

EXAMINER	
WILLIAMS, LAWRENCE B	

ART UNIT	PAPER NUMBER
2634	

DATE MAILED: 01/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/977,193	PERSSON, JONAS	
	Examiner	Art Unit	
	Lawrence B Williams	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 October 2000*.

2a)☒ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 October 200* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 3.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. This application has been filed with informal drawings, which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

Specification

2. The abstract of the disclosure is objected to because examiner suggests applicant remove the phrase "[Fig 1]". Correction is required. See MPEP § 608.01(b).

3. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3, 6-8, 11-12, 14-15, 17-18, 21 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Valentine et al. (US Patent 5,748,678).

(1) With regard to claim 1, Valentine et al. discloses in Fig(s). 2 and 4, a method of adjusting a radio frequency signal produced by radio frequency circuitry in response to receipt of phase and amplitude control signals from digital baseband circuitry which operates to convert digital data signals into such phase and amplitude control signals, wherein the phase and amplitude control signals are adjusted in the digital baseband circuitry (30) in order to compensate for time alignment errors which occur in the radio frequency circuitry (abstract; col. 3, lines 34-42).

(2) With regard to claim 2. Valentine et al. also discloses wherein the time alignment errors in the radio frequency signal are detected by comparing phase and amplitude components of the radio frequency signal with phase and amplitude control signals produced by the digital baseband circuitry (col. 3, lines 34-42).

(3) With regard to claim 3, Valentine et al. also discloses wherein the phase and amplitude control signals are adjusted in dependence upon the comparison of phase and amplitude components of the radio frequency signal with phase and amplitude control signals produced by the digital baseband circuitry (col. 3, lines 34-42).

(4) With regard to claim 6, Valentine et al. discloses a method of adjusting a radio frequency signal produced by radio frequency circuitry in response to receipt of inphase and quadrature (I and Q) control signals from digital baseband circuitry (30) which operates to convert digital data signals into such inphase and quadrature (I and Q) control signals, wherein the inphase and quadrature (I and Q) control signals are adjusted in the digital baseband circuitry in order to compensate for time alignment errors which occur in the radio frequency circuitry (abstract; col. 3, lines 34-42).

(5) With regard to claim 7, claim 7 inherits all limitations of claim 6 above. Furthermore, Valentine et al. also discloses wherein the time alignment errors in the radio frequency signal are detected by comparing inphase and quadrature (I and Q) components of the radio frequency signal with inphase and quadrature (I and Q) control signals produced by the digital baseband circuitry (col. 3, lines 34-42).

(6) With regard to claim 8, claim 8 inherits all limitations of claim 7 above. Furthermore, Valentine et al. also discloses wherein the inphase and quadrature (I and Q) control signals are adjusted in dependence upon the comparison of inphase and quadrature (I and Q) components of the radio frequency signal with inphase and quadrature (I and Q) control signals produced by the digital baseband circuitry (col. 3, lines 34-42).

(7) With regard to claim 11, Valentine et al. discloses in Fig(s). 2 and 4, a radio frequency transmitter which includes digital baseband circuitry (30) operable to produce phase and amplitude control signals at a first frequency from input digital data signals (A/D), the transmitter also including radio frequency circuitry operable to output radio frequency signals in dependence upon phase and amplitude control signals or upon inphase and quadrature (I and Q) signals received from the digital baseband circuitry, wherein the digital baseband circuitry is operable to correct the phase and amplitude control signals for time alignment errors that occur in the radio frequency circuitry (abstract; col. 3, lines 34-42).

(8) With regard to claim 12, claim 12 inherits all limitations of claim 11 above. Furthermore, Valentine et al. also discloses wherein the digital baseband circuitry

includes means for comparing phase and amplitude components of an RF signal with delayed phase and amplitude control signals, and is operable to adjust the phase and amplitude control signals in dependence upon the result of the comparison (col. 3, lines 34-42).

(9) With regard to claim 14, Valentine et al. discloses in Fig(s). 2 and 4, a radio frequency transmitter which includes digital baseband circuitry operable to produce inphase and quadrature (I and Q) control signals at a first frequency from input digital data signals, the transmitter also including radio frequency circuitry operable to output radio frequency signals in dependence upon inphase and quadrature (I and Q) control signals or upon amplitude and phase signals received from the digital baseband circuitry, wherein the digital baseband circuitry is operable to correct the inphase and quadrature (I and Q) control signals for time alignment errors that occur in the radio frequency circuitry (abstract; col. 3, lines 34-42).

(10) With regard to claim 15, claim 15 inherits all limitations of claim 14 above. Furthermore, Valentine et al. also discloses wherein the digital baseband circuitry includes means for comparing inphase and quadrature (I and Q) components of an RF signal with delayed inphase and quadrature (I and Q) control signals, and is operable to adjust the inphase and quadrature (I and Q) control signals in dependence upon the result of the comparison.

(11) With regard to claim 17, claim 17 inherits all limitations of claim 1 above. Though Valentine et al. does not explicitly discloses the method of controlling radio frequency circuitry being implemented in a mobile telecommunications device, he does disclose properties that would be inherit to a mobile communications environment in his

background of invention (col. 1, line 7-col. 2, line 20). Therefore it would be inherent that the method would be used in a mobile communications device.

(12) With regard to claim 18, claim 18 inherits all limitations of claim 11 and 17 above.

(13) With regard to claim 21, claim 21 inherits all limitations of claims 6, 17 and 18 above.

(14) With regard to claim 23, claim 23 inherits all limitations of claims 14, and 21 above.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 4-5, 9-10, 13, 16, 19-20, 22 and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Suga et al. (US Patent 6,771,708 B1).

(1) With regard to claim 4, Suga et al. discloses in Fig(s). 2 and 4, a method of adjusting timing of amplitude and phase components in an output RF signal, the method comprising: generating amplitude and phase signals from input data; adjusting the generated amplitude and phase signals to produce adjusted amplitude and phase signals; supplying the adjusted amplitude and phase signals to a radio frequency circuit; and

transmitting an output RF signal from the radio frequency circuit, wherein adjusting the generated amplitude and phase signals comprises: detecting an output RF signal to produce detected amplitude and phase signals; subjecting the generated phase signal to a first time delay (31) to produce a delayed phase signal, the first time delay being such as to minimize a difference between the delayed phase signal and the detected phase signal; subjecting the generated amplitude signal to a second time delay (32) to produce a delayed amplitude signal, the second time delay being such as to minimize the difference between the delayed amplitude signal and the detected amplitude signal; and adjusting the generated amplitude and phase signals in dependence upon the first and second time delays (abstract; col. 4, line 11-col. 5, line 54).

(2) With regard to claim 5, claim 5 inherits all limitations of claim 4 above. Furthermore, Suga et al. also discloses in Fig. 3, wherein the adjusted amplitude and phase signals are converted to inphase and quadrature (I and Q) signals (I1, Q1) for supply to the radio frequency circuit.

(3) With regard to claim 9, Suga et al. discloses in Fig(s). 2 and 4, a method of adjusting timing of inphase and quadrature (I and Q) components in an output RF signal, the method comprising: generating inphase and quadrature (I and Q) signals from input data; adjusting the generated inphase and quadrature (I and Q) to produce adjusted inphase and quadrature (I and Q) signals; supplying the adjusted inphase and quadrature (I and Q) signals to a radio frequency circuit; and transmitting an output RF signal from the radio frequency circuit, wherein adjusting the generated inphase and quadrature (I and Q) signals comprises: detecting an output RF signal to produce detected inphase and quadrature (1 and Q) signals; subjecting the generated inphase (I) signal to a first time

delay (31) to produce a delayed inphase (I) signal, the first time delay being such as to minimize a difference between the delayed inphase (I) signal and the detected inphase (I) signal; subjecting the generated quadrature (Q) signal to a second time delay (32) to produce a delayed quadrature (Q) signal, the second time delay being such as to minimize the difference between the delayed quadrature (Q) signal and the detected quadrature (Q) signal; and adjusting the generated inphase and quadrature (I and Q) signals in dependence upon the first and second time delays (abstract; col. 4, line 11-col. 5, line 54).

(4) With regard to claim 10, claim 10 inherits all limitations of claim 9 above. Furthermore, Suga et al. also discloses wherein the adjusted inphase and quadrature (I and Q) are converted to phase and amplitude signals for supply to the radio frequency circuit (abstract; col. 2, lines 14-24).

(5) With regard to claim 13, Suga et al. discloses in Fig(s). 2 and 4, an apparatus for adjusting timing of phase and amplitude components of an RF signal, the apparatus comprising: an RF detector unit (A, B) for detecting an RF signal and operable to produce detected phase and amplitude signals therefrom; an adjustment unit (17, 27) connected to receive generated phase and amplitude signals and operable to output adjusted phase and amplitude signals in dependence upon received adjustment control signals; a delay unit (C) connected to receive the generated phase and amplitude signals and operable to delay those signals by respective time delays to produce delayed phase and amplitude signals, the respective time delays being determined such that respective differences between detected and delayed phase and amplitude signals are minimized; and a delay calculation unit (47) which is operable to generate adjustment control signals in dependence upon the respective time delays and to supply the

adjustment control signals in dependence upon respective time delays and to supply the adjustment control signals to the adjustment unit.

(6) With regard to claim 16, claim 16 inherits all limitations of claims 9 and 14 above.

(7) With regard to claim 19, claim 19 inherits all limitations of claim 13 above. While Suga et al. is silent as to a mobile communication device, he does disclose his invention for compensating for the non-linear distortion characteristic of an amplifier in a transmitting system. This would inherently include a mobile communications transmitter as well as any other transmitter comprising an amplifier with non-linearity characteristics.

(8) With regard to claim 20, claim 20 inherits all limitations of claims 4 and 19 above.

(9) With regard to claim 22, claim 22 inherits all limitations of claims 9 and 20 above.

(10) With regard to claim 24, claim 24 inherits all limitations of claims 16 and 23 above.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a.) Nagasaka et al. discloses in US 2002/0131523 A1 a Circuit and Method for Compensating for Non-Linear Distortion.

b.) Chow et al. discloses in US Patent 6,614,854 B1 a System and Method for Adaptive Predistortion.

c.) Moriyama et al. discloses in US Patent 6,091,941 a Radio Apparatus.

d.) Moriyama et al. discloses in US Patent 6,081,698 a Radio Apparatus and Offset Compensating Method.

e.) Tapio discloses in US Patent 6,647,073 B2 Linearization and Modulation Device.

f.) Persson discloses in US Patent 6,246,286 B1 an Adaptive Linearization of Power Amplifiers.

g.) Miyashita discloses in US Patent 6,288,610 B1 a Method and Apparatus for Correcting Signals, Apparatus for Compensating for Distortion, Apparatus for Preparing Distortion Compensating Data, and Transmitter

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence B Williams whose telephone number is 571-272-3037. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lawrence B. Williams

lbw
January 8, 2005

AMANDA T. LE
PRIMARY EXAMINER